



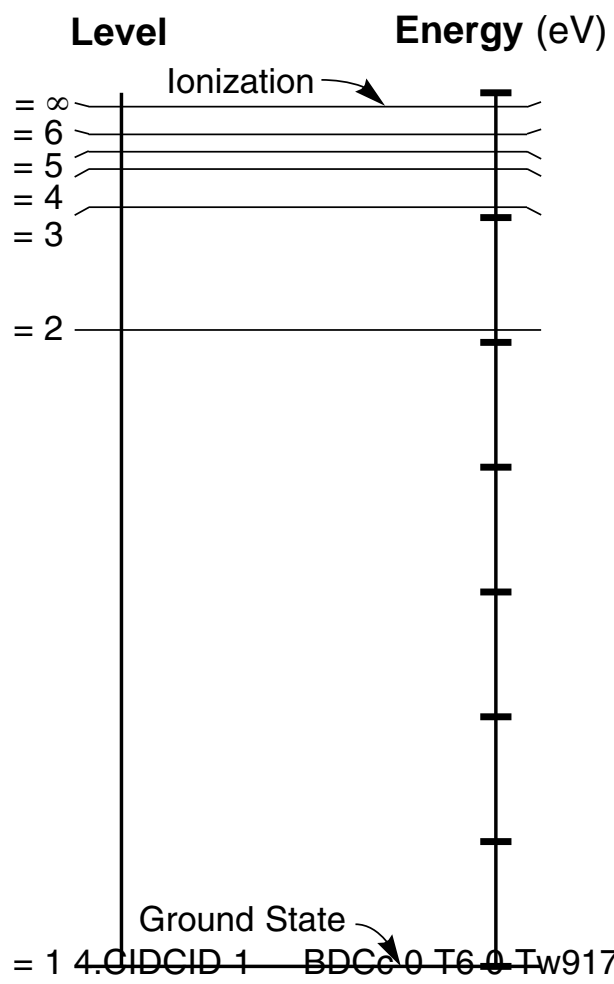
# The Electromagnetic Spectrum

Wavelength in a vacuum (m)

$10^{-13}$   $10^{-12}$   $10^{-11}$   $10^{-10}$   $10^{-9}$   $10^{-8}$   $10^{-7}$   $10^{-6}$   $10^{-5}$   $10^{-4}$   $10^{-3}$   $10^{-2}$   $10^{-1}$   $10^0$   $10^1$   $10^2$   $10^3$   $10^4$

# Energy Level Diagrams

## Hydrogen



Level

= 1 4.C1DC1D 1 BDCc 0 T6 0 Tw917 B-ogen 4.C19CID 1 BDCc 0 T606 0 T9627 B-ogen



-	-	-
-	-	-





---

—

—

---

---

## Mechanics

$$a = \frac{v}{t}$$

$$v = \frac{\Delta x}{\Delta t}$$

$$v_f = v_i + at$$

$$v_f^2 = v_i^2 + 2a\Delta x$$

$$v_f^2 = v_i^2 + 2a\Delta x$$

$$A_y = A \sin \theta$$

$$A_x = A \cos \theta$$

$$F_f = \mu F_N$$

$$F_g = \frac{GMm}{r^2}$$

$$J = F\Delta t$$

=

$$J = F\Delta t = \Delta p$$

$$J = F\Delta t = \Delta p$$

$$F = \frac{\Delta p}{\Delta t}$$

$$E_k = \frac{1}{2}mv^2$$

$$F = \frac{\Delta E}{\Delta x}$$

$$F = \frac{\Delta E}{\Delta x}$$

$$\Delta E = F\Delta x$$

$$E = \frac{1}{2}mv^2$$

$$W = Fd = \Delta E$$

$$E = E_k + E_p + E_{int}$$

$$F_f = \mu F_N = F_f$$

= acceleration

= centripetal acceleration

A = any vector quantity

x = displacement or distance

E = total energy

F = force

F\_c = centripetal force

F\_f = force of friction

F\_g = weight or force due to gravity

F\_N = normal force

F\_net = net force

F\_s = force on a spring

g = acceleration due to gravity or gravitational field strength

G = universal gravitational constant

h = height

J = impulse

k = spring constant

E\_k = kinetic energy

m = mass

p = momentum

P = power

E\_p = potential energy

E\_s = potential energy stored in a spring

U = internal energy

r = radius or distance between centers

t = time interval

v = velocity or speed

v\_avg = average velocity or average speed

W = work

ΔL = change in spring length from the equilibrium position

Δ = change

θ = angle

μ = coefficient of friction